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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/522,049 | 01/20/2005 | Jeong Il Byun | WA390/64724 | 3912 |

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| EXAMINER |
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MAYES, MELVIN C

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| ART UNIT | PAPER NUMBER |
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1734

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/522,049 | BYUN ET AL. | |
| | Examiner | Art Unit | |
| | Melvin Curtis Mayes | 1734 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 10-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/15/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

(1)

Applicant's election with traverse of Claims 1-9 in the reply filed on February 23, 2006 is acknowledged. The traversal is on the ground(s) that search and examination of the entire application can be made without serious burden. This is not found persuasive because the product of Claims 10-17 requires search not required for the method claims 1-9, such as search for products made by other methods which result in the claimed structure. Further, the restriction has set forth that the groups lack the same technical feature, and even if Applicant contends that the groups share the same technical feature, this feature does not define a contribution over the prior art, as set forth in the following rejection, and therefore restriction is proper.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

(2)

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

(3)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(4)

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "anisotropic conduction adhesive" in line 11. There is insufficient antecedent basis for this limitation in the claims.

Claims 8 and 9 recite the limitation "said insulating film." There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 103

(5)

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(6)

Claims 1 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. 5,800,650 in view of Fuji et al. 2003/0064147.

Anderson et al. disclose a method of making a flexible multilayer printed circuit board comprising: providing laminates 35, 45 comprising a flexible substrate and conductive patterns 20, 22, 24, 26 (circuit boards), coating both sides of the circuit boards with a dielectric coverlayer 60, 62, 64, 66 to provide electrical insulation and environmental resistance, the coverlayers 62, 64 provided over the conductive patterns 22, 24 to provide external access to the contact pads of the conductive patterns at a number of predetermined points; providing an anisotropic adhesive 70 of conductive particles in a thermosetting polymer between the circuit boards to provide electrical connection between the circuit boards; and laminating the circuit boards under heat and pressure. Anderson et al. disclose that the insulative coverlayers are provided on the circuit boards to a thickness of at most 50 microns, most preferably at most about 5 microns, depending on the amount of dielectric protection needed for the particular application. Anderson et al. disclose providing the insulative coverlayer 60 completely over the

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conductive pattern 20 to protect the circuit boards from the external environment (thus on a plain portion and a side portion of circuit patterns and on a bottom portion of a circuit board, as claimed in Claim 8) while coverlayers 62, 64 which provide external access to the contact pads only partially cover the surface of the circuit patterns (thus on a side portion of the circuit pattern and a bottom portion of the circuit board, as claimed in Claim 9) (col. 7-16). Anderson et al. disclose providing the coverlayers 62, 64 to provide external access to the conductive patterns by screen printing or coating a dielectric ink followed by cutting apertures in the coverlayers at desired points but does not specifically disclose providing the dielectric ink as an insulating resin solution.

Fuji et al. teach that in the manufacture of a flexible circuit board having a resin coverlayer having no voids, the cover layer is formed by providing a resin solution, wetting the surface of the circuit substrate with a solvent, and applying and drying the resin solution [0007]-[0018].

It would have been obvious to one of ordinary skill in the art to have modified the method of Anderson et al. by providing the dielectric ink for forming the insulative coverlayers as a resin solution applied to the flexible circuit board after wetting the circuit boards with solvent, as taught by Fuji et al., to provide insulative coverlayers having no voids. The use of a resin solution for printing or coating on the circuit boards to form the coverlayers would have been obvious to one of ordinary skill in the art, as taught by Fuji et al.

Providing the coverlayers of thickness in the range of either 0.1-5 microns or 0.3- 3 microns, as claimed in Claims 5 and 6, would have been obvious to one of ordinary skill in the art, as Anderson et al. disclose that the coverlayers are most preferably of thickness of at most

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5 microns, depending on the amount of dielectric protection needed for the particular application, thus suggesting to provide coverlayers of any thickness less than 5 microns as long as suitable dielectric protection is provided.

(7)

Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anderson et al. 5,800,650 in view of Fuji et al. 2003/0064147 as applied to claim 1, and further in view of JP 2002-179761.

Fuji et al. teach that the resin solution for forming a coverlayer of excellent insulation property can be provided by using a solution of resin or precursor of the resin, of resin such as epoxy resin [0018].

JP 2002-179761 (JP '761) teaches that an epoxy resin excellent in solvent solubility, excellent in heat resistance, moistureproofness and adhesiveness and useful as insulating material for circuit boards comprises an epoxy resin having a softening temperature of 63°C or more. JP '761 teaches providing epoxy resin of softening temperature of 71-85°C (Abstract and computer translation).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined by providing the resin solution as a solution of epoxy or precursor of epoxy, as taught by Fuji et al., as resin which provides a coverlayer of excellent insulation property, and to have provided the epoxy resin as a thermoplastic epoxy resin of softening temperature of at least 63°C, such as in the range of 71-85°C, as taught by JP '761, as epoxy resin excellent in solvent solubility, excellent in heat resistance, moistureproofness and adhesiveness and useful as insulating material for circuit boards. The use of a thermoplastic

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epoxy resin having a softening temperature in the range of 63-85°C, encompassed in the range as claimed in Claim 2 and overlapping the range as claimed in Claim 4, would have been obvious to one of ordinary skill in the art, as suggested by JP '761 as epoxy resin of excellent properties for use as insulating material for circuit boards, thus useful for providing the epoxy resin solution for forming an insulative coverlayer.

Conclusion

(8)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references disclose bonding circuit boards using coverlayers and anisotropic adhesive.

(9)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
March 3, 2006